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July 13, 2001

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RECEIVED

JUL 13 2001

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Ms. Magalie R. Salas
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: *Ex Parte* Presentation of US GPS Industry Council; ET Docket 98-153

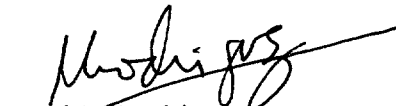
Dear Ms. Salas:

This letter provides notice that on July 11, 2001, Dr. Charles Trimble, Ms. Amy Mehlman and undersigned counsel, representing the U.S. GPS Industry Council, met with Mr. Peter Tenhula from the Office of the Chairman, to discuss matters concerning the referenced proceeding. More specifically, Dr. Trimble provided an assessment on the effects of ultra wideband ("UWB") interference on GPS receive equipment, based on the test results presented to the Commission and a matter of record in this proceeding. A copy of the written presentation provided to Mr. Tenhula is attached to this letter.

Dr. Trimble also discussed a possible solution to the current proceeding, whereby UWB devices could be authorized in identified frequency bands where there are no safety-of-life services and where a "band manager" would be assigned to manage use of the spectrum.

An original and one copy of this letter are being submitted for inclusion in the record of the subject proceeding. Please direct questions concerning this letter and attachment to undersigned counsel.

Respectfully submitted,



Raul R. Rodriguez
For the U.S. GPS Industry Council

Attachment

cc (w/o attach.): Mr. Peter Tenhula

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**SUMMARY TEST RESULTS TO DATE
UWB INTERFERENCE TO EXISTING SERVICES
(1 TO 6 GHz)**

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Purpose of Testing Prior To UWB NPRM

To establish whether UWB devices could operate at Part 15 levels on a non-interfering basis:

All tests show:

- UWB interference to existing services.
- That UWB devices cannot operate at Part 15 levels on a non-interfering basis in the 1 to 6 GHz band.
- “ Below 3.1 GHz would be quite challenging” (NTIA).

Summary Test Conclusions On GPS-UWB Compatibility

National Telecommunications Information Administration (NTIA) Test:

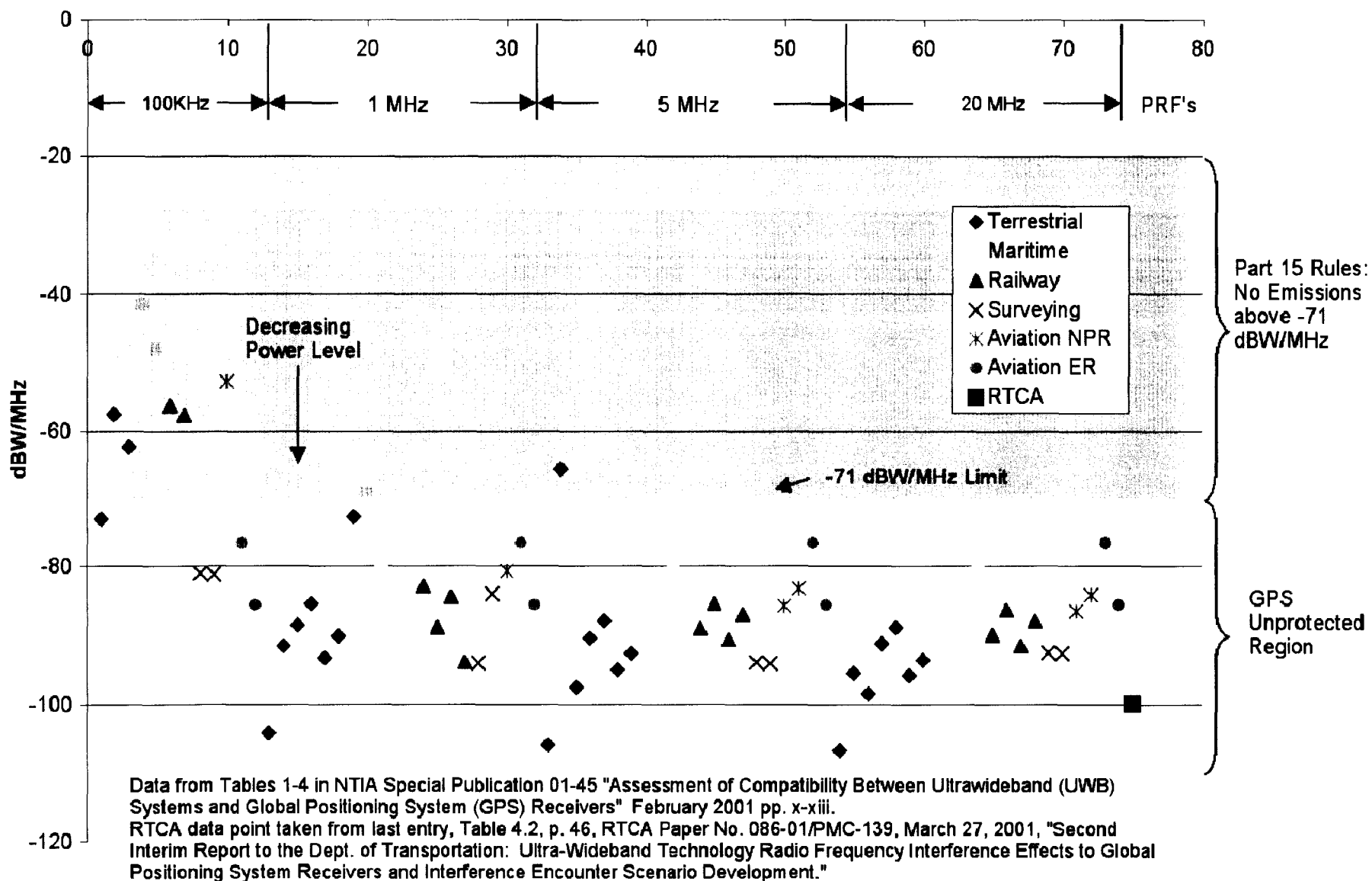
- Of 74 total test cases operating under existing Part 15 rule limits, 65 test cases (88%) show significant interference to a broad range of GPS use (graphic display on page 4).

Radio Technical Committee Aeronautics (RTCA SC-159) Analysis of DoT/Stanford University Test:

- To protect aviation services for precision approach and landing, the UWB signal power density must be below -100 dBW/MHz in the GPS band.
- To protect GPS mobile E911, may require significantly more stringent levels.

UWB Interference to GPS Applications: Max Allowable UWB EIRP for 74 Test Cases

Test Case No.



Summary Test Conclusions On GPS-UWB Compatibility

Johns Hopkins University Applied Physics Laboratory (JHU-APL) Analysis of University of Texas Advanced Research Laboratory (UT-ARL) Test:

The Executive Summary of the JHU-APL reports on their findings:

- UWB signal effects on GPS receiver performance are strongly influenced by the UWB time coding or modulation technique used.
- Some UWB signals, including those tested by ARL-UT, produce effects that are comparable to those produced by white noise.
- Some UWB signals can produce effects on GPS receiver performance that are more severe than those produced by white noise.
- For UWB devices that comply with existing Part 15 emission limits, the effects of the UWB signals tested by ARL-UT on GPS receiver performance become catastrophic for separation distances less than 3 meters. Similar results were obtained for an existing Part 15 device that was tested.

Summary Test Conclusions On GPS-UWB Compatibility (Continued)

Johns Hopkins University Applied Physics Laboratory (JHU-APL)
Analysis of University of Texas Advanced Research Laboratory
(UT-ARL) Test:

- For separation distances greater than 3 meters, the UWB effects on GPS receivers eventually become less severe.
- UWB signal effects on GPS receiver performance vary significantly among GPS receivers.

Summary Test Conclusions On GPS-UWB Compatibility

Peer Review of JHU-APL Analysis:

RTCA SC-159 correction of inconsistent assumptions in the JHU-APL analysis suggest an increase in the required separation distance of 30 to 300 meters, bringing the results in line with NTIA.

Summary Test Conclusions On UWB Compatibility With Federal (Non-GPS) Systems

NTIA Study:

Analysis concluded that the operation of UWB devices “below 3.1 GHz would be quite challenging.”

**Summary Test Conclusions
On UWB Compatibility With
Personal Communication Services (PCS)
and Mobile E911 Services**

QUALCOMM, Inc. Study:

The proposed UWB rule that allows the operation of UWB in the 2 GHz band will have harmful impact on the normal operation of CDMA wireless devices in the voice, data and GPS modes.

Sprint PCS Study:

UWB devices operating at Part 15 levels will cause loss of network capacity and would disrupt GPS E911 services.

Tests Results Pending

NTIA :

Additional testing of two GPS receivers:

- Narrow correlator
- Aviation TSO-C129A

DoT/Rockwell Collins:

Additional testing and analysis of a GPS aviation receiver.

What We Still Do Not Know

Testing to date has not addressed the following:

- GPS Acquisition and Reacquisition in Presence of UWB transmissions:
 - NTIA observed difficulty in developing a reacquisition test effort. Both acquisition/reacquisition are essential to GPS applications and are more sensitive than tracking.
- The aggregate environment, including:
 - Multiple UWB devices operating at the same time: pulse-like, CW-like, and noise-like.
 - UWB communication networks operating at high data rates and in the presence of the different types of UWB devices listed above.

What We Still Do Not Know

- Military GPS receivers need to be tested.
- Antenna loading effects for UWB consumer devices needs to be quantified.
- A comprehensive quantification of the existing noise floor needs to be established.
- Existing services need to be analyzed for sensitivity to a rising noise floor.

Summary List of Test Reports To Date

NTIA Report 01-384:

Hoffman, J. Randy et. Al., "Measurements to Determine potential Interference to GPS Receivers from Ultrawideband Transmission Systems", February 2001.

NTIA Special Publication 01-45:

Jones, Steven K., et. Al., "Assessment of Compatibility Between Ultrawideband (UWB) Systems and Global Positioning System (GPS) Receivers", February 2001.

RTCA SC-159 Paper No. 289-00/PMC-108:

"Ultra-wideband Technology Radio Frequency Interference Effects to GPS and Interference Scenario Development, First Interim Report to the Department of Transportation", September 2000.

RTCA SC-159 Paper No. 039-01/PMC-128:

"Preliminary Aviation Approach Segment for the Second Interim Report to the Department of Transportation: Ultra-Wideband Technology Radio Frequency Interference Effects to GPS and Interference Scenario Development", February 2001.

RTCA SC-159 Paper No.086-01/PMC-139:

"Second Interim Report to the Department of Transportation: Ultra-Wideband Technology Radio Frequency Interference Effects to GPS and Interference Encounter Scenario Development", March 2001.

Applied Research Laboratory University of Texas at Austin, TL-SG-01-01:

Cardoza, Miguel et. Al., "Final Report, Data Collection Campaign for Measuring UWB/GPS Compatibility Effects, February 2001.

Johns Hopkins University Applied Physics Laboratory:

"Final Report, UWB-GPS Compatibility Analysis Project", March 2001.

Summary List of Reports To Date

NTIA Report 01-383:

Kissick, William A., "The Temporal and Spectral Characteristics of Ultrawideband Signals, January 2001.

NTIA Special Publication 01-43:

Roosa, Paul C., Jr., "Assessment of Compatibility Between Ultrawideband Devices and Selected Federal Systems, January 2001.

Summary List of Reports On UWB Compatibility With Personal Communication Services (PCS) and Mobile E911 Services

QUALCOMM, Inc.:

Soliman, Samir, "Report of Qualcomm Incorporated", March 2001

Sprint PCS:

Sprint PCS, McKee, Charles W.; Time Domain Corporation, Ross, Jeffrey L.; Telcordia Technologies, Dr. Padgett, Jay, "Attachment 1: A Model for Calculating the Effect of UWB Interference on a CDMA PCS System", September 2000.

Sprint PCS, McKee, Charles W., "Sprint PCS Supplemental Comments", October 2000.

Sprint PCS, Charles McKee and Rikkee Davis, "Some Supplemental Comments Regarding NTIA's UWB Analyses Reports", February 2001